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SUNLIGHT, MOONLIGHT, AND TWILIGHT

FOR

ANTARCTICA

1975 – 1977

by

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EXPLANATION

The graphs on the following pages give data concerning the rising and setting of the Sun and Moon and the duration of twilight for high southern latitudes; these graphs are similar to the graphs in the *Air Almanac* for northern latitudes. Graphs are preferable to tables for high latitudes because they give a clearer picture of the phenomena and of the attainable accuracy in any given case. In the regions of the graph that are difficult to read accurately, the phenomenon itself is uncertain.

The graphs Semiduration of Sunlight give for latitudes south of S. 60° the number of hours from sunrise to meridian passage or from meridian passage to sunset. There is continuous daylight in the area marked "Sun above horizon". The figures near the top indicate for several convenient dates the local mean times of meridian passage; with the aid of the intermediate dots the L.M.T. on any given day may be obtained to the nearest minute. The L.M.T. of sunrise may be found by subtracting the semiduration from the time of meridian passage and the time of sunset by adding.

Examples. On February 20 in latitude S. 72° the semiduration is about $8^h\ 50^m$. The time of meridian passage is $12^h\ 14^m$, and hence the L.M.T. of sunrise is $03^h\ 24^m$, and of sunset $21^h\ 04^m$. In latitude S. 70° the Sun is continuously above the horizon from about November 19 till about January 24.

The graphs Duration of Civil Twilight give the interval from the beginning of morning civil twilight (Sun 6° below horizon) to the time of sunrise or from the time of sunset to the end of civil twilight. In the region "Continuous twilight or sunlight" the Sun never goes lower than 6° below the horizon.

The graphs Duration of Nautical Twilight give similar data for a depression of 12°.

Examples. For February 20 in latitude S. 72° the graph indicates the duration of civil twilight as about $2^h\ 00^m$. Applying this to the time of sunrise, $03^h\ 24^m$, and of sunset, $21^h\ 04^m$, found in the preceding example, the beginning of morning twilight becomes $01^h\ 24^m$, and the end of evening twilight, $23^h\ 04^m$. In latitude S. 70°, there is continuous twilight or sunlight from about November 1 till about February 11.

The graphs Semiduration of Moonlight give for the Moon the same data as the graphs Semiduration of Sunlight give for the Sun. The scales near the top give the L.M.T. of meridian passage. In addition, the phase symbols are placed on the graphs to show the day on which each phase occurs. Since the times of meridian passage and the semiduration change more rapidly from day to day for the Moon than for the Sun, special care will be required in reading the graphs accurately.

For most purposes in these high latitudes a rough idea of the time of moonrise or moonset is all that is required and this may be obtained by a glance at the graph.

Example. On 1975 May 7, the phase is about half way between last quarter and New Moon, and the Moon crosses the meridian at 9^h L.M.T. In latitude S. 75° the semiduration of moonlight taken for time of meridian passage is 5 hours, giving moonrise at 4^h L.M.T. on May 7, and moonset at 14^h L.M.T. on May 7.

If greater accuracy is required it is necessary to read the graph for the G.M.T. of each phenomenon at the desired meridian. The dates indicated on the graph are for 00^h G.M.T., and intermediate values of the G.M.T. may be located by estimation.

Example. It is required to improve the results obtained in the preceding example, assuming the observer to be in longitude W. 90°, or 6^h west.

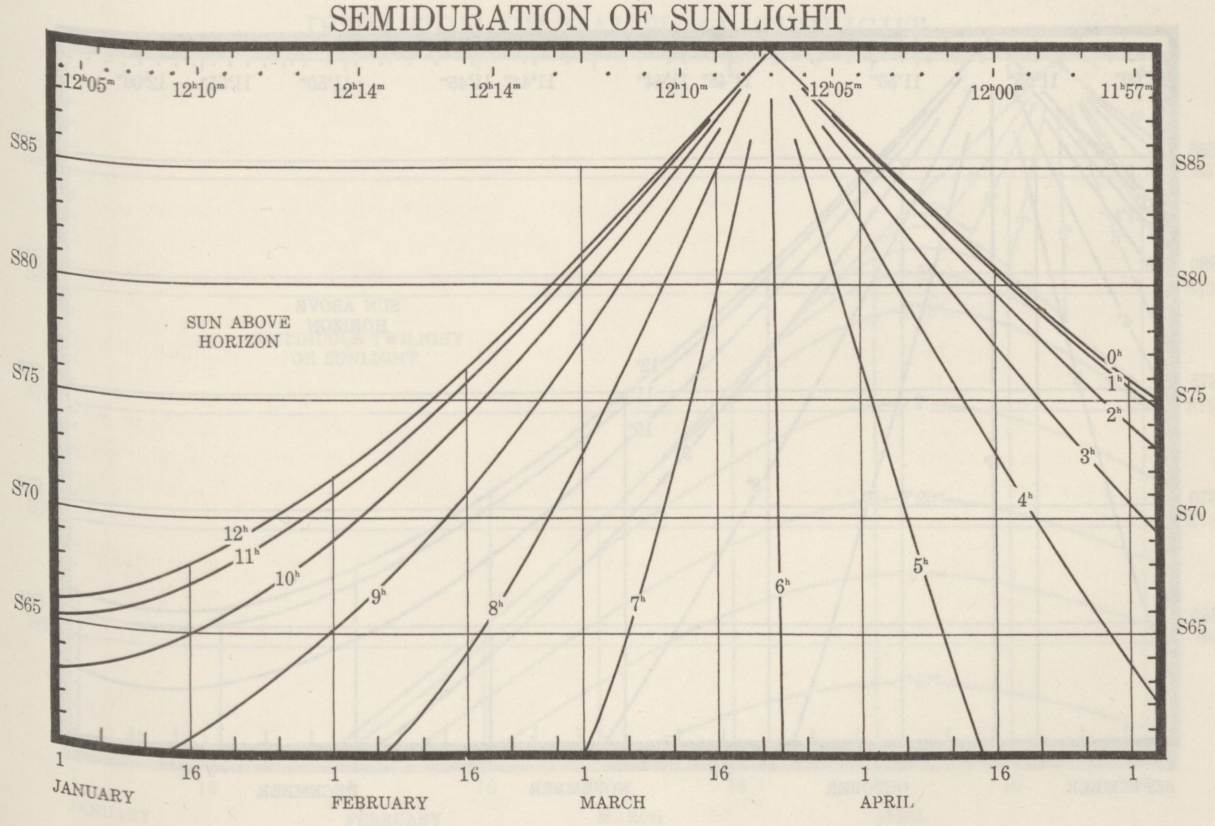
The values found previously were:

Time of meridian passage	1975	May	7^d	09^h	**L.M.T.** = May	7^d	15^h	**G.M.T.**
Semiduration of moonlight				5				
Time of moonrise		May	7	04	**L.M.T.** = May	7	10	**G.M.T.**
Time of moonset		May	7	14	**L.M.T.** = May	7	20	**G.M.T.**

Returning to the graph with these three values of the G.M.T. the following results are obtained:

Time of meridian passage	1975	May	7^d	09^h	10^m	**L.M.T.** = May	7^d	15^h	10^m	**G.M.T.**
Semiduration for moonrise				4	45					
Time of moonrise		May	7	04	25	**L.M.T.** = May	7	10	25	**G.M.T.**
Semiduration for moonset				4	20					
Time of moonset		May	7	13	30	**L.M.T.** = May	7	19	30	**G.M.T.**

SEMIDURATION OF SUNLIGHT



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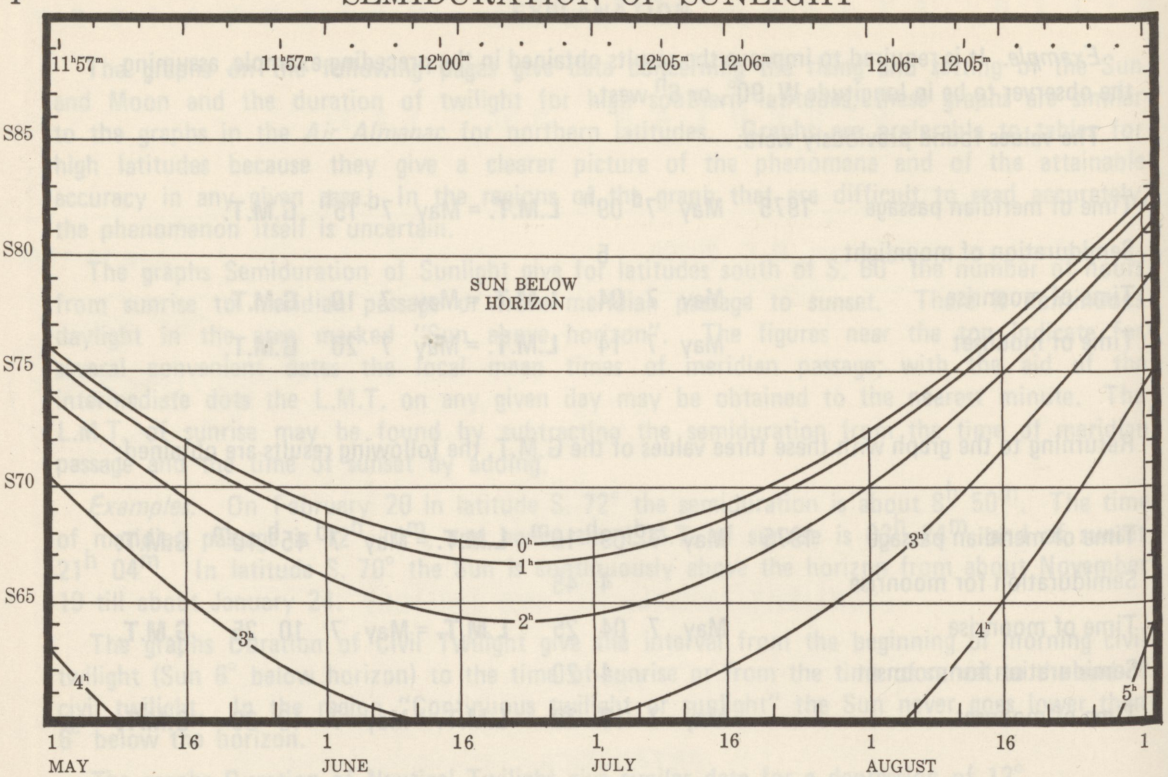

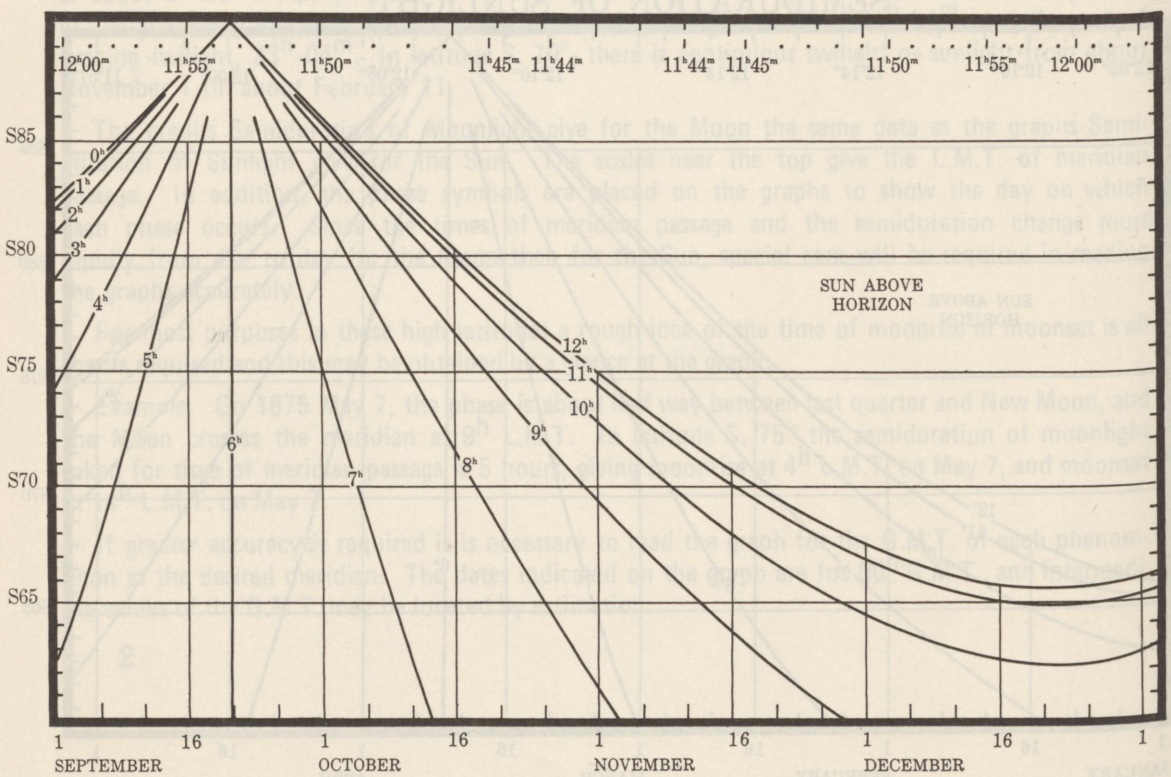

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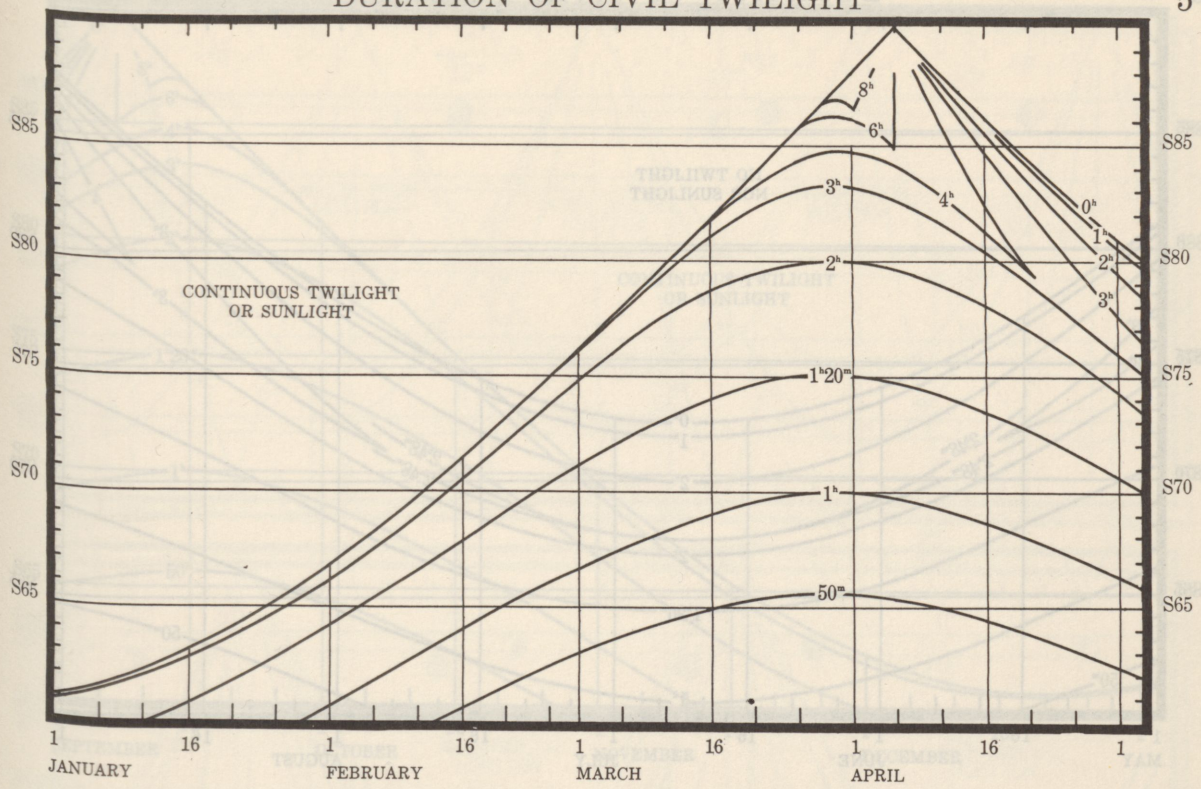

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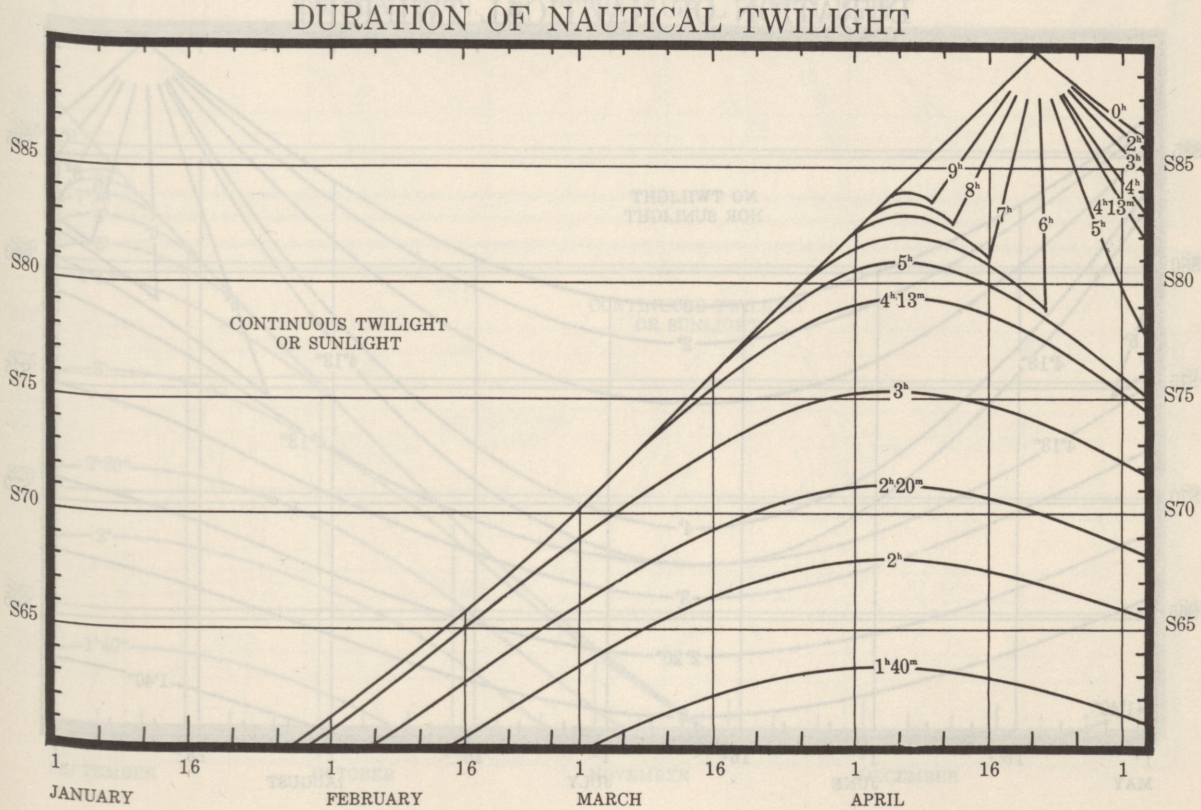

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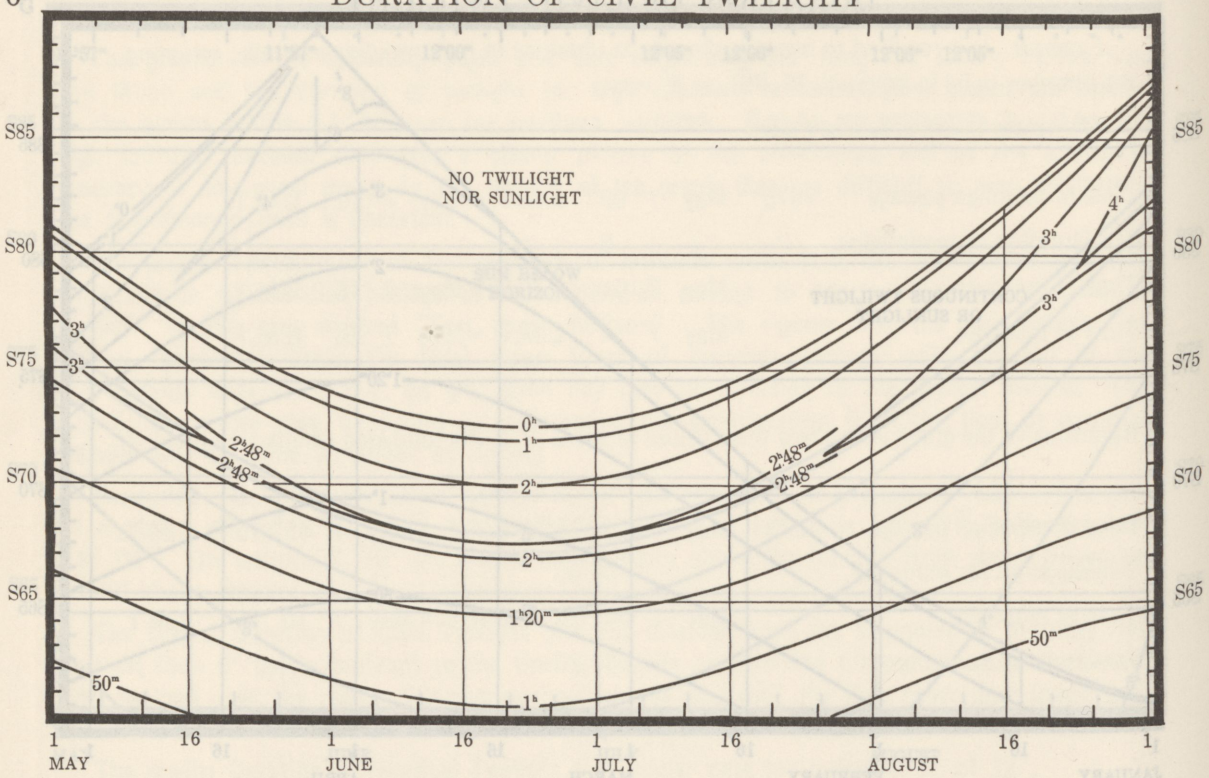

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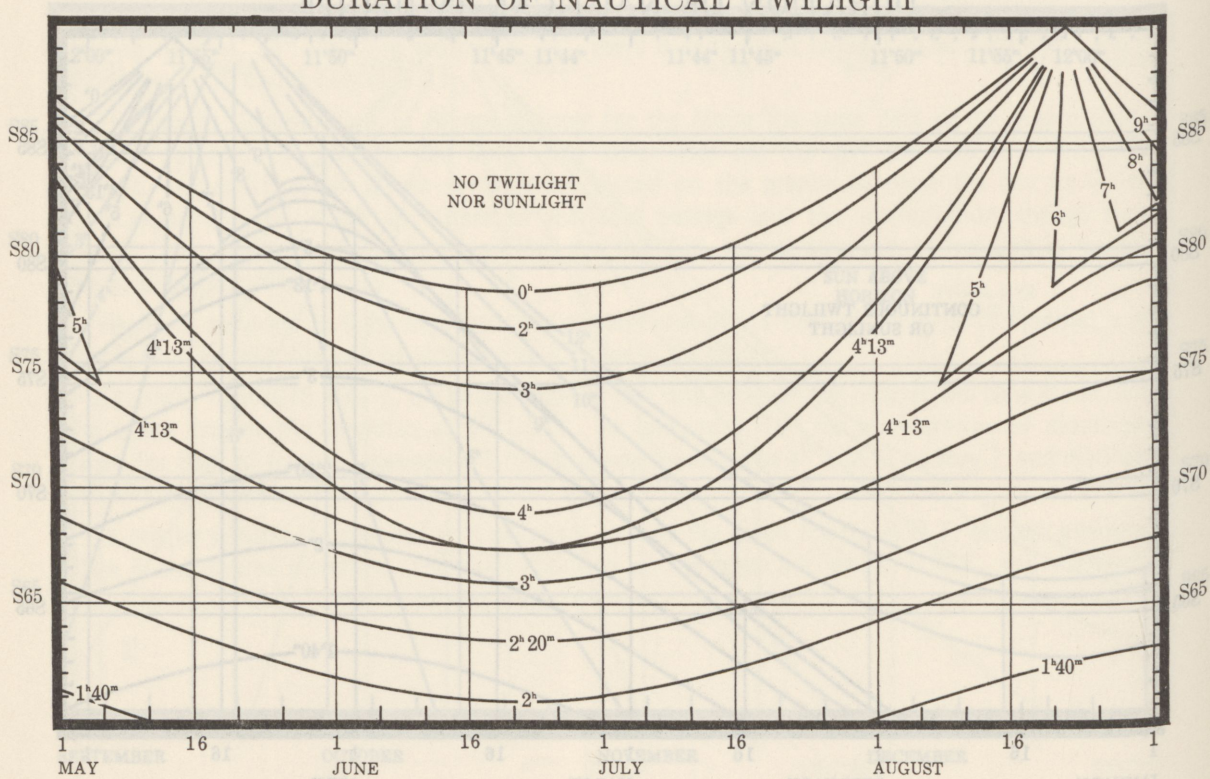

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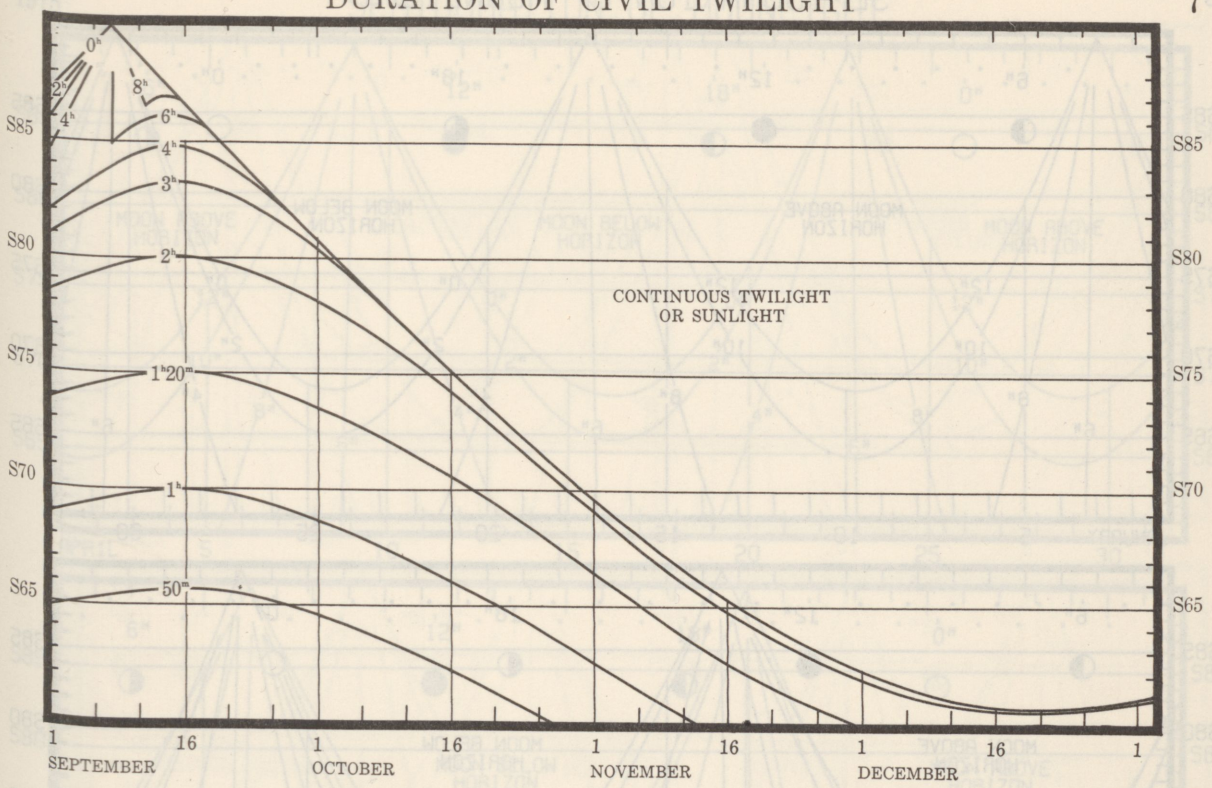

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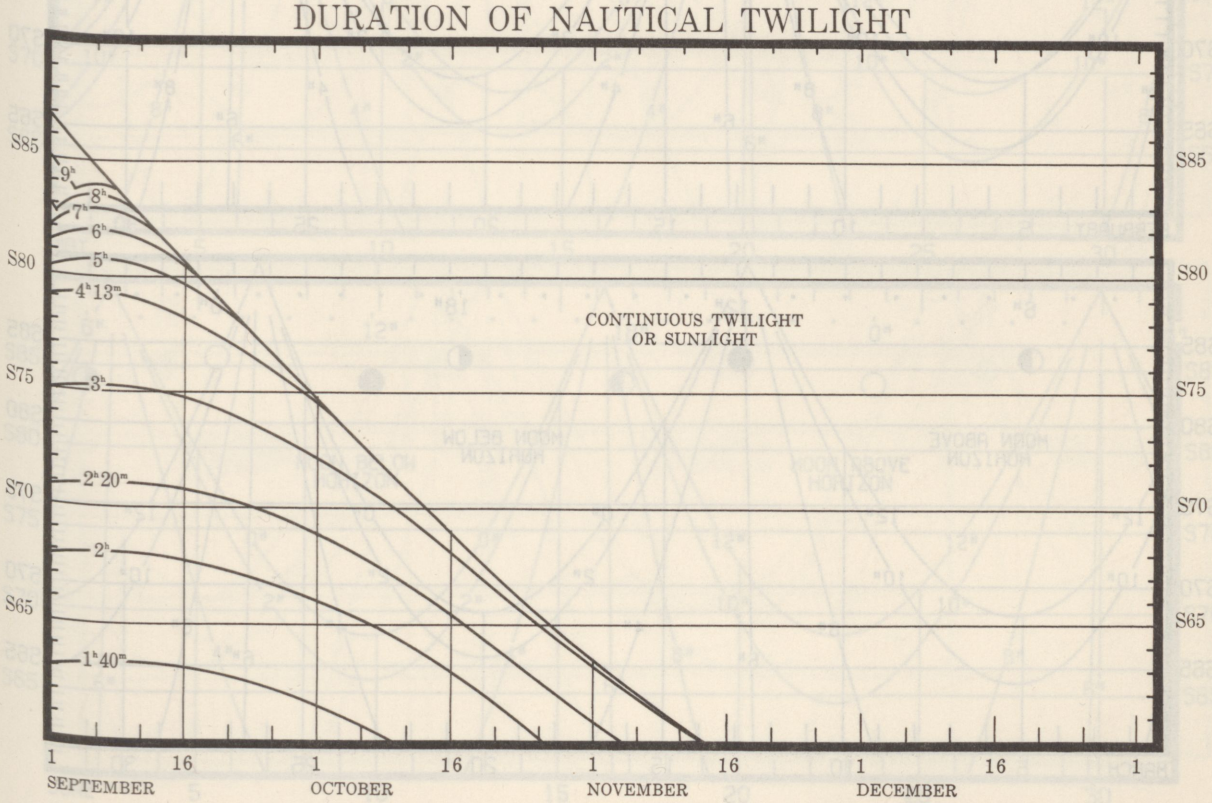

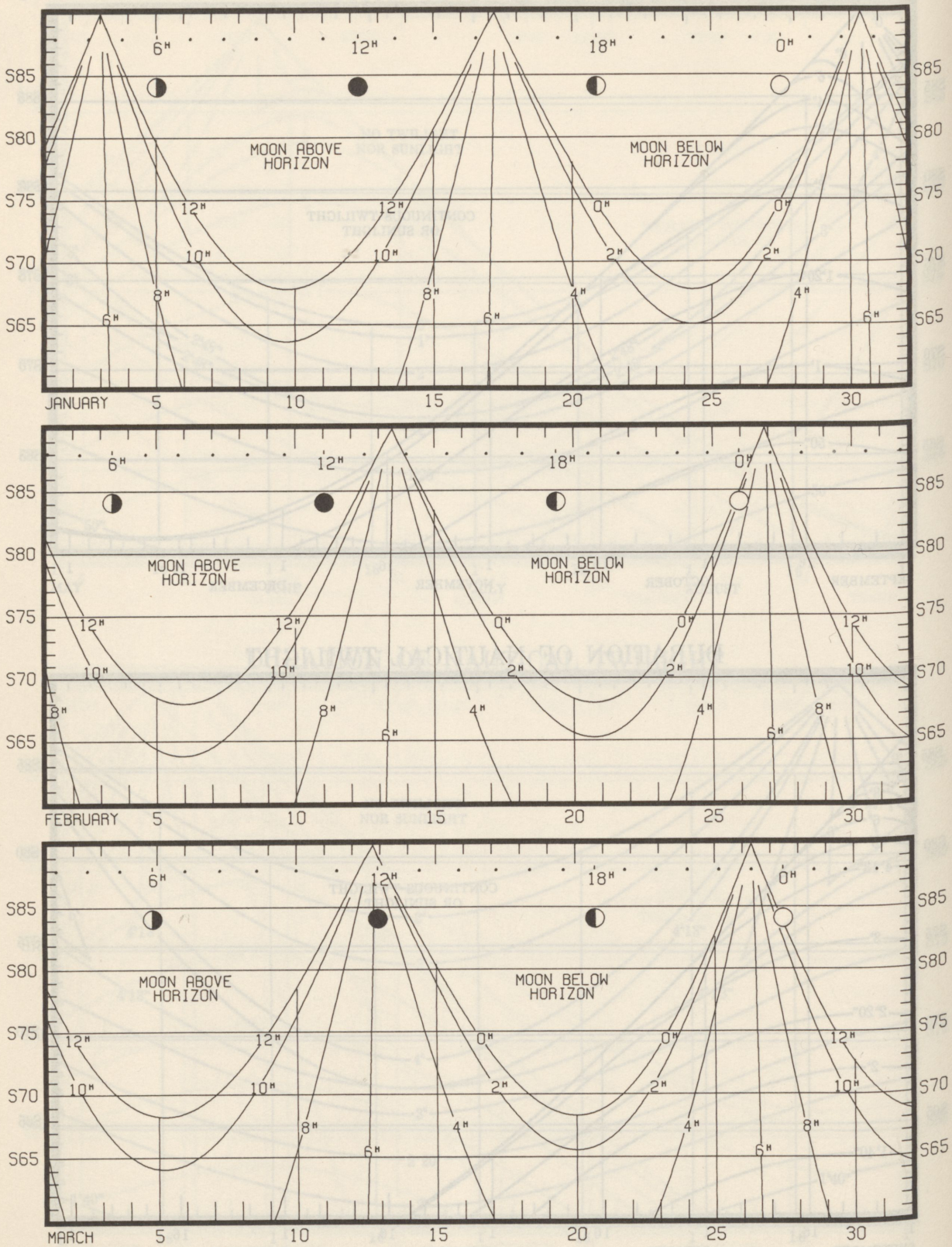
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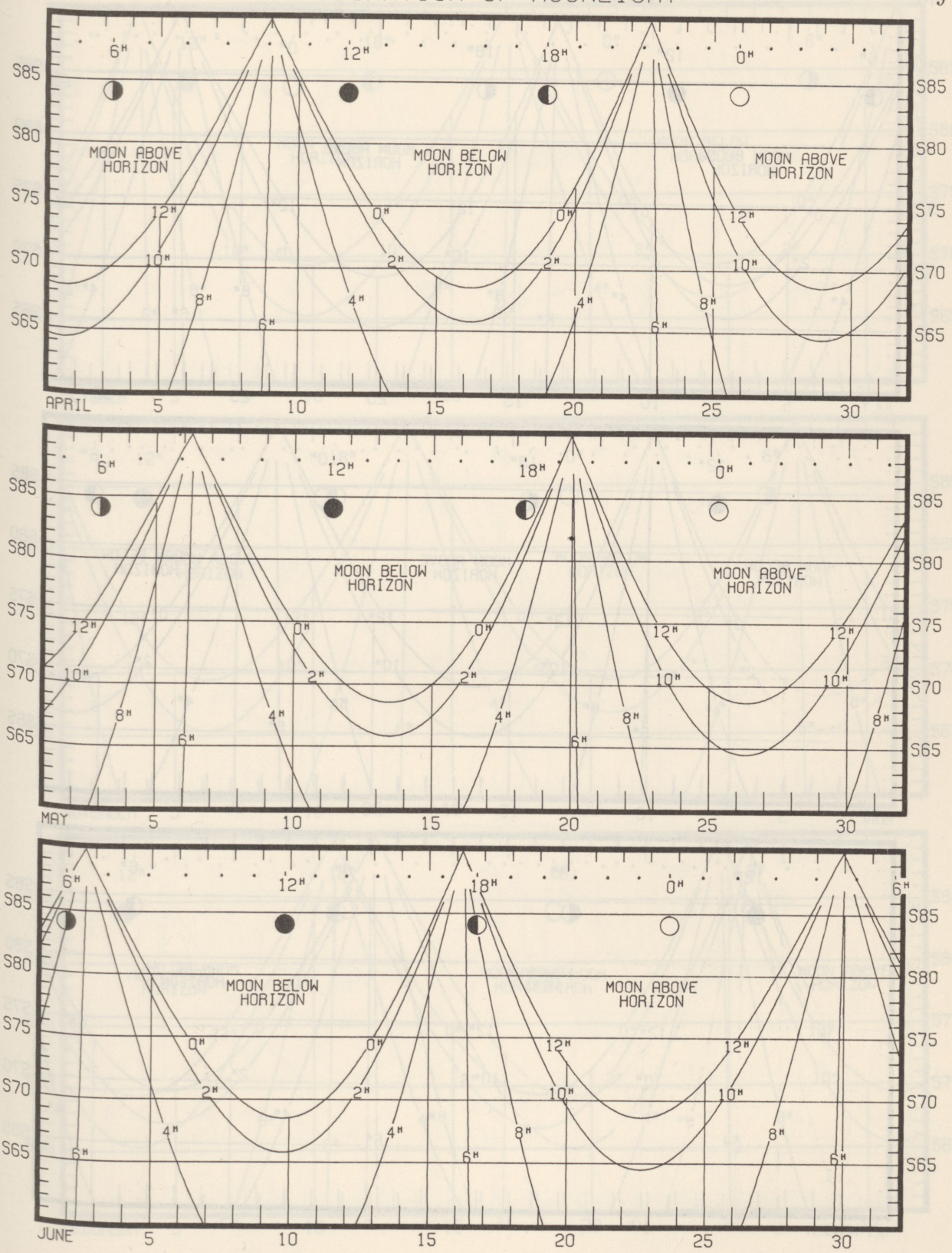
SEMIDURATION OF MOONLIGHT



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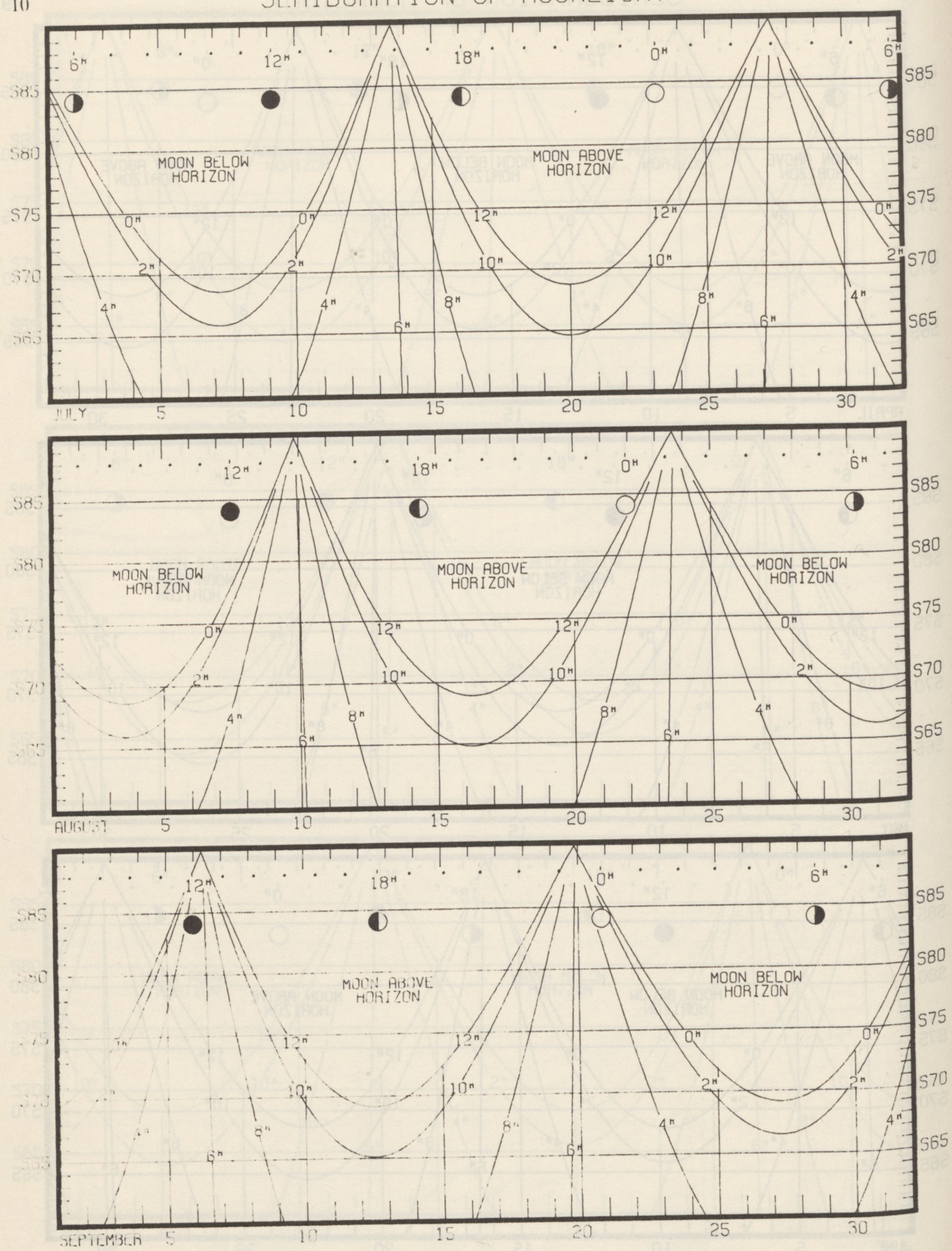

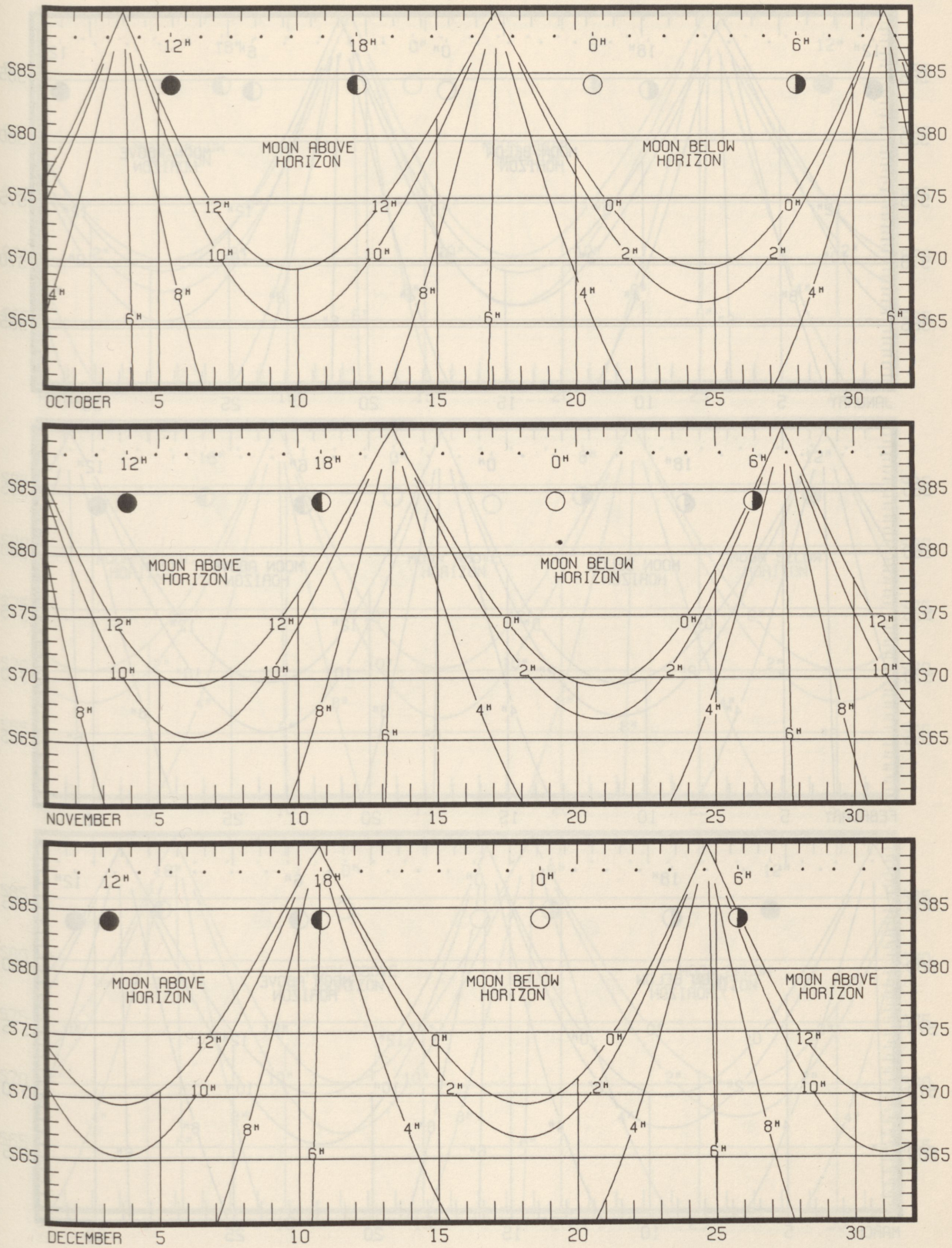
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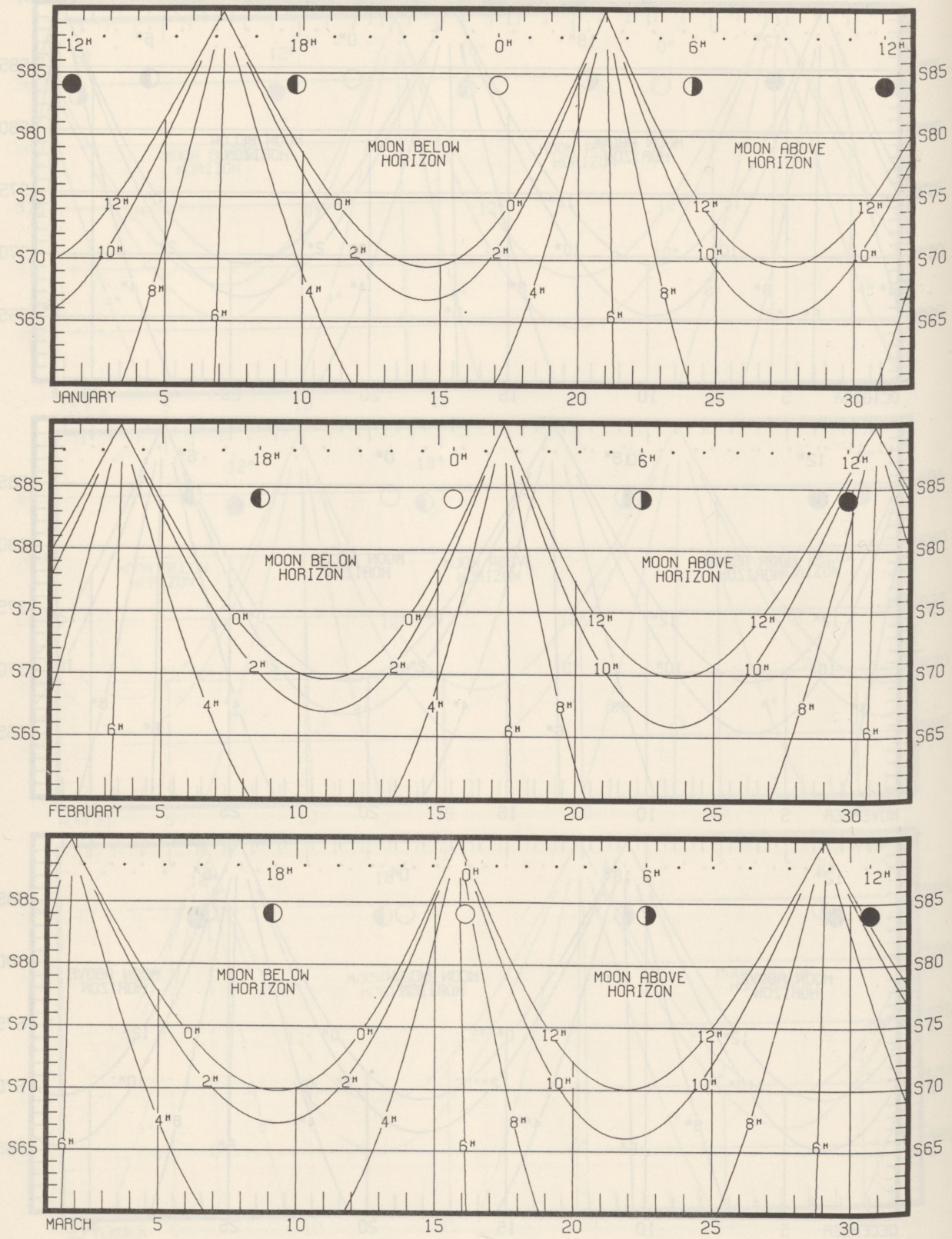
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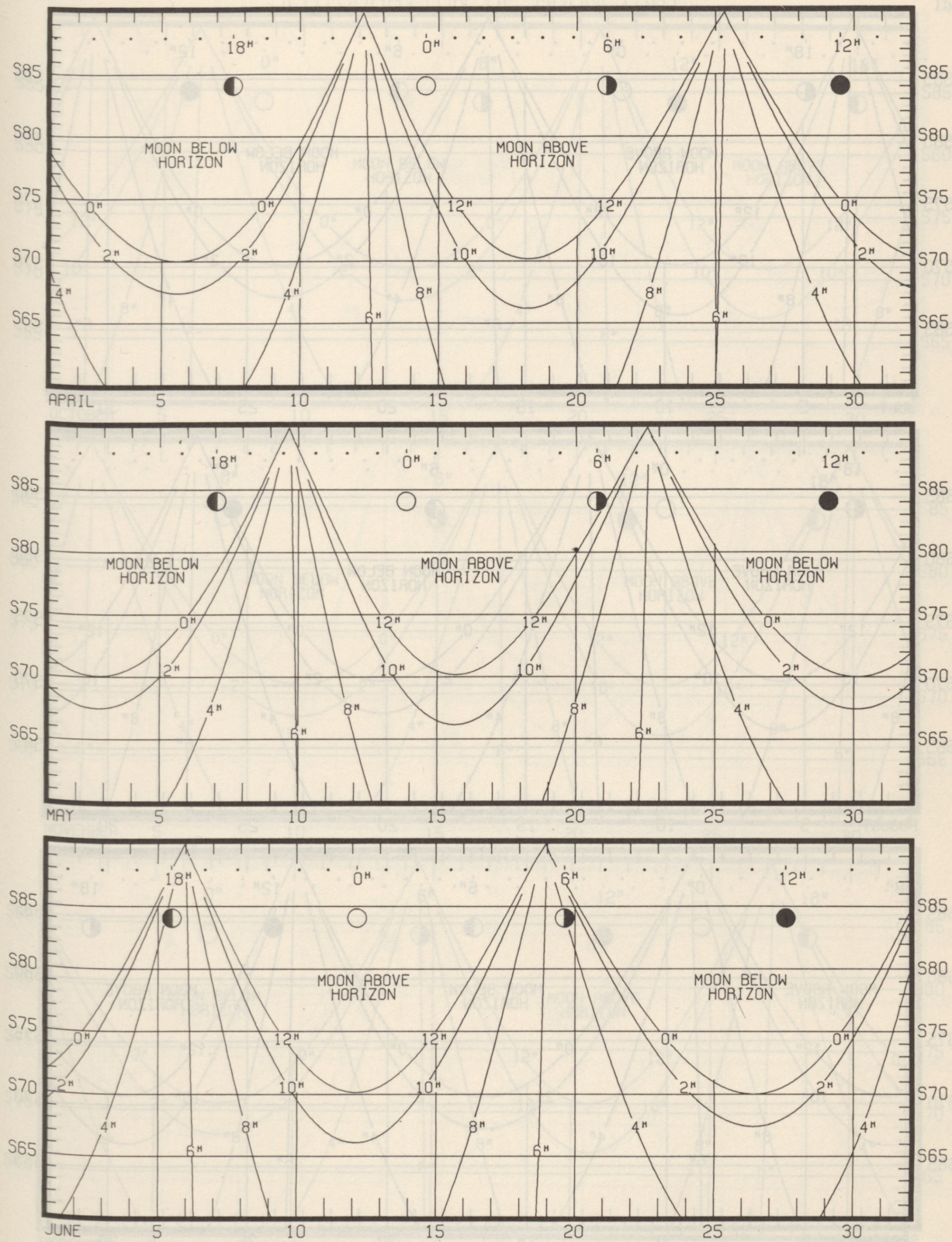
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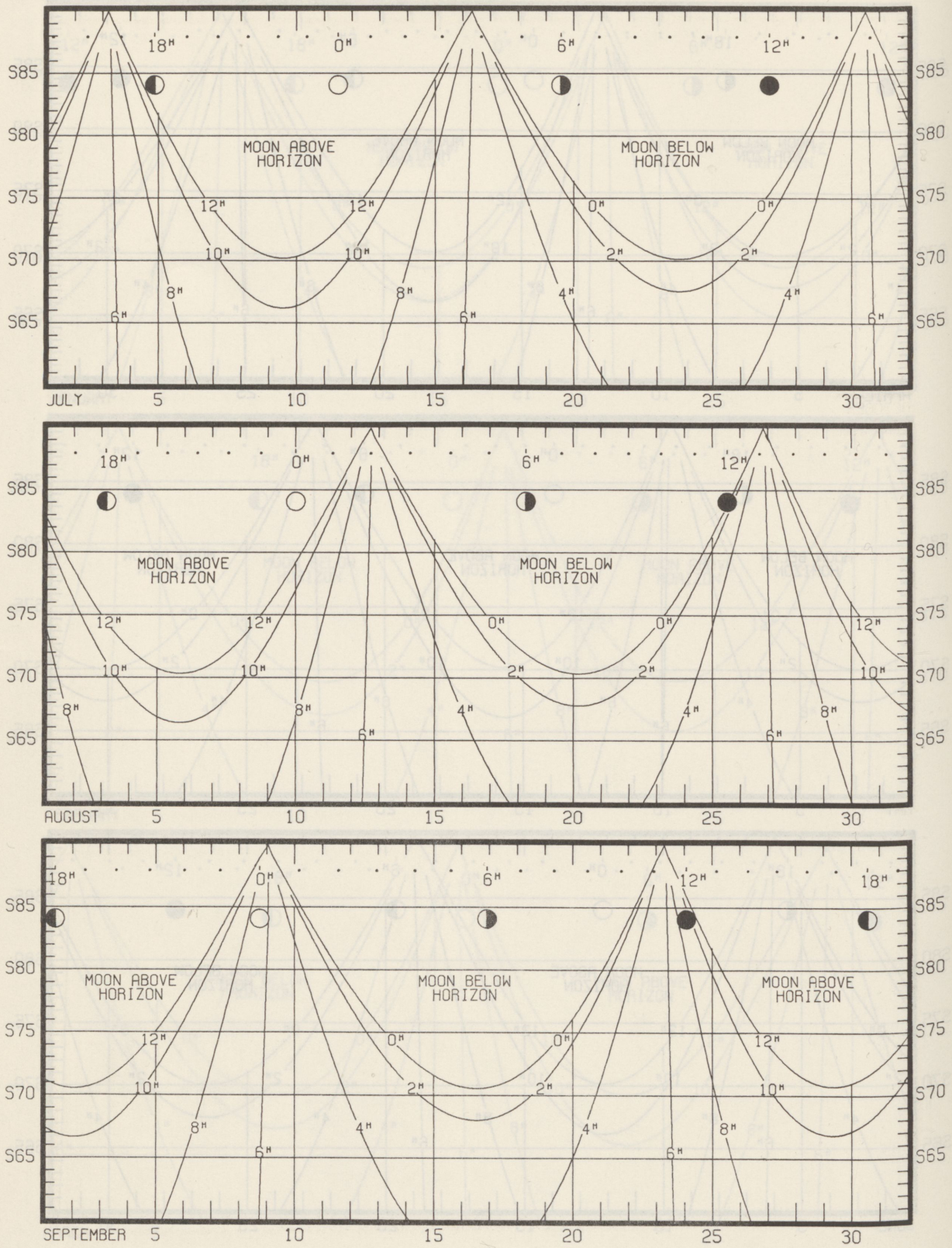
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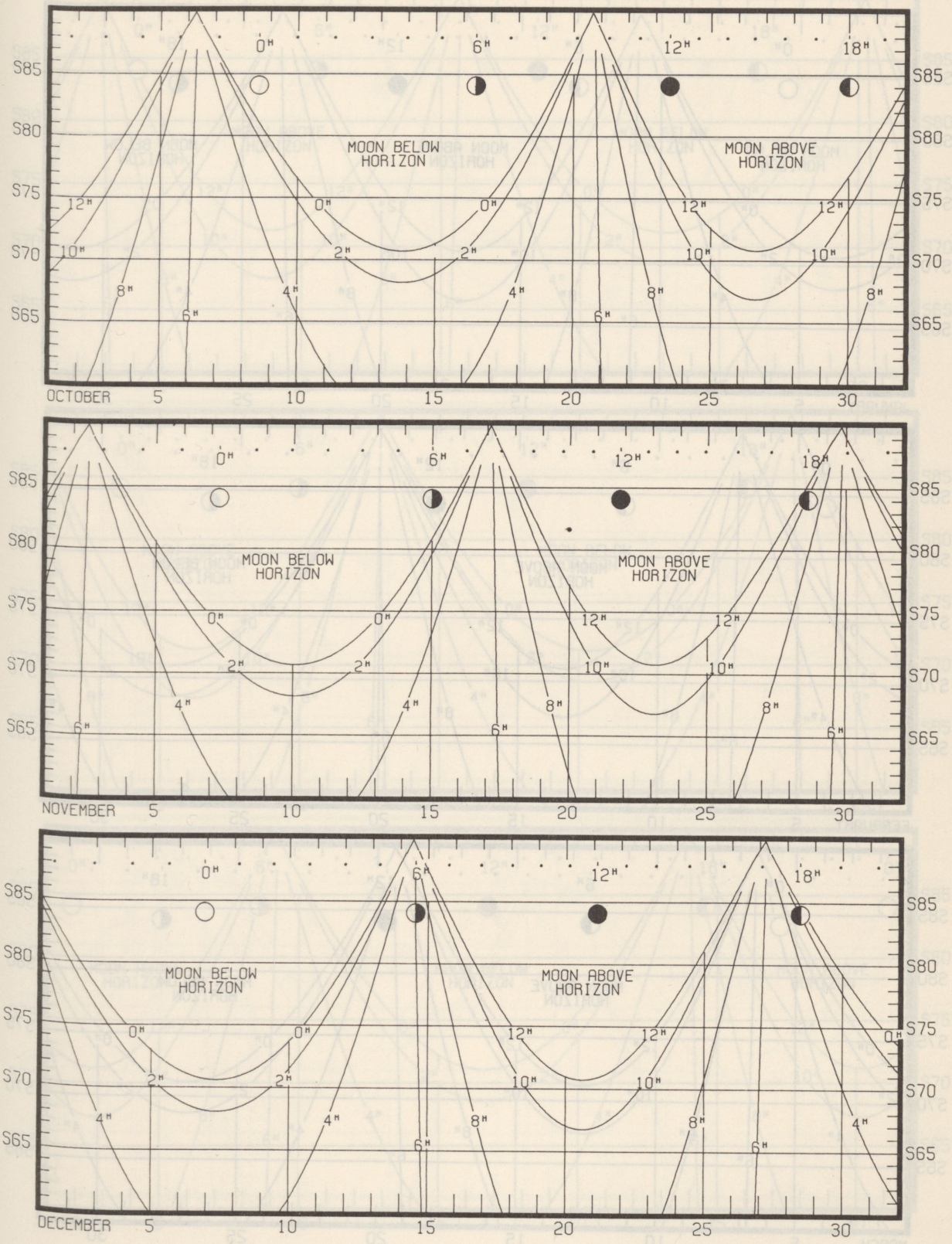
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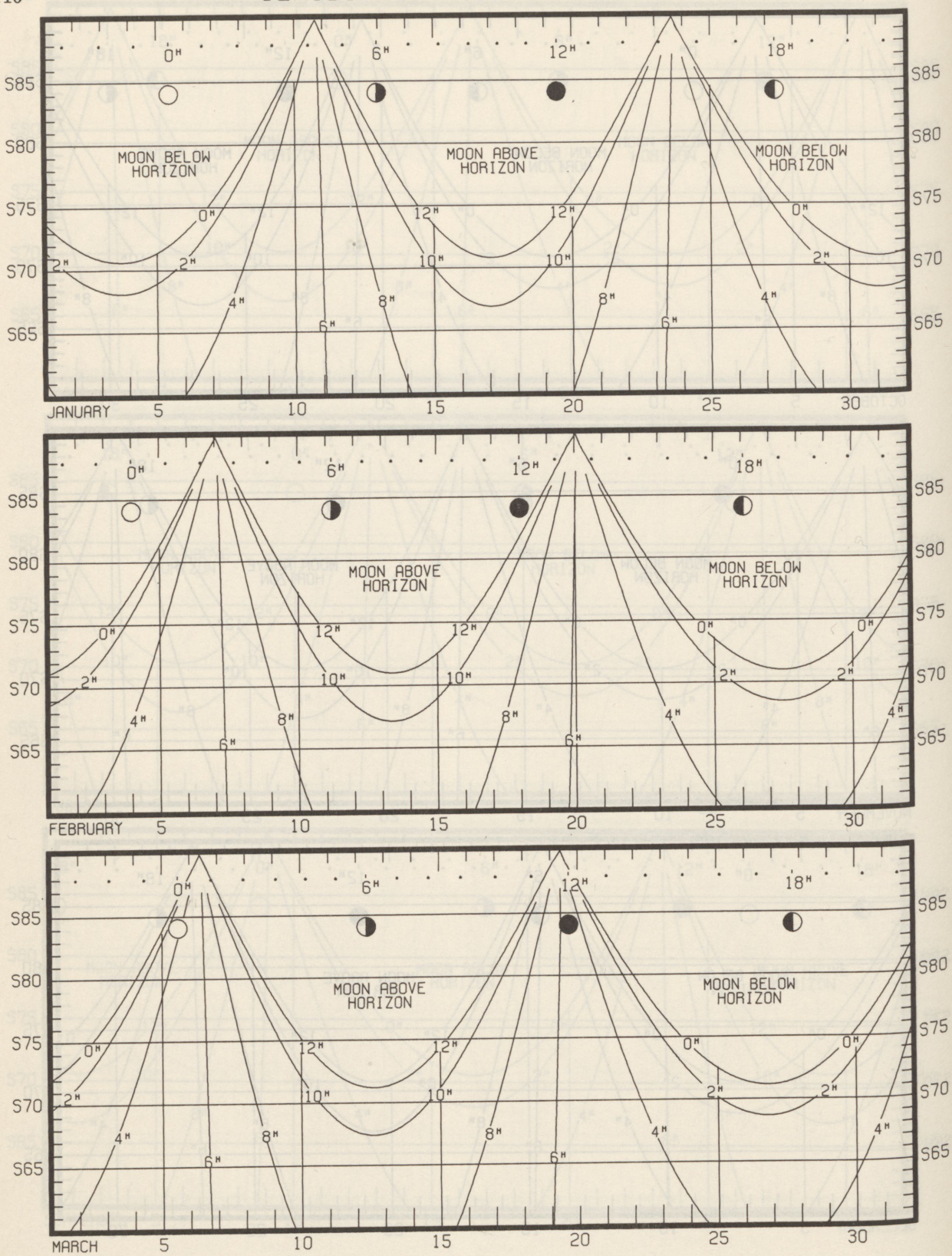
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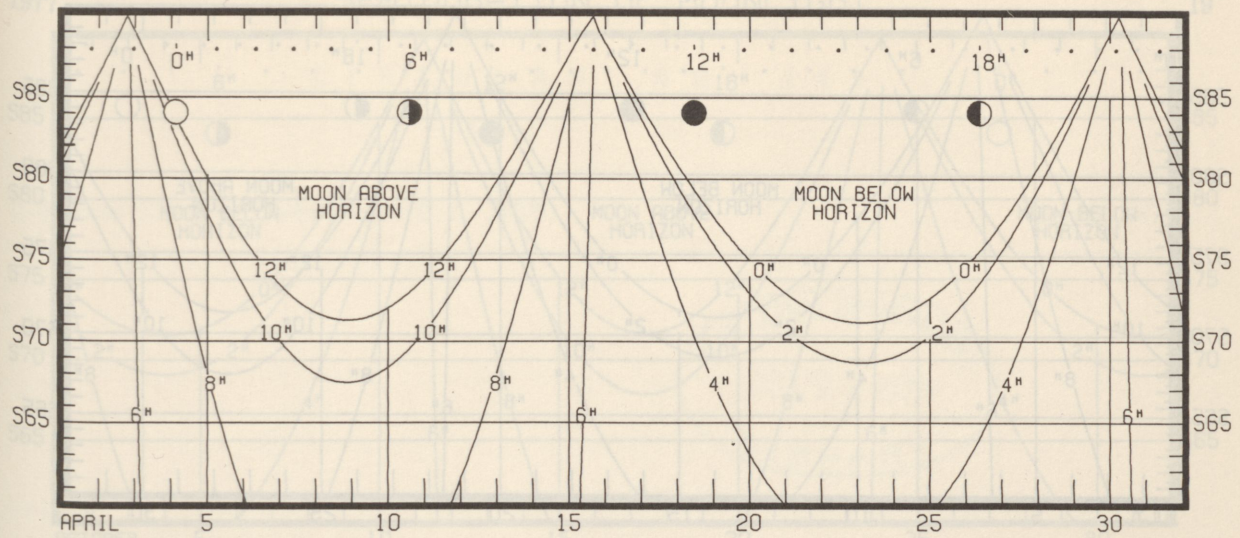
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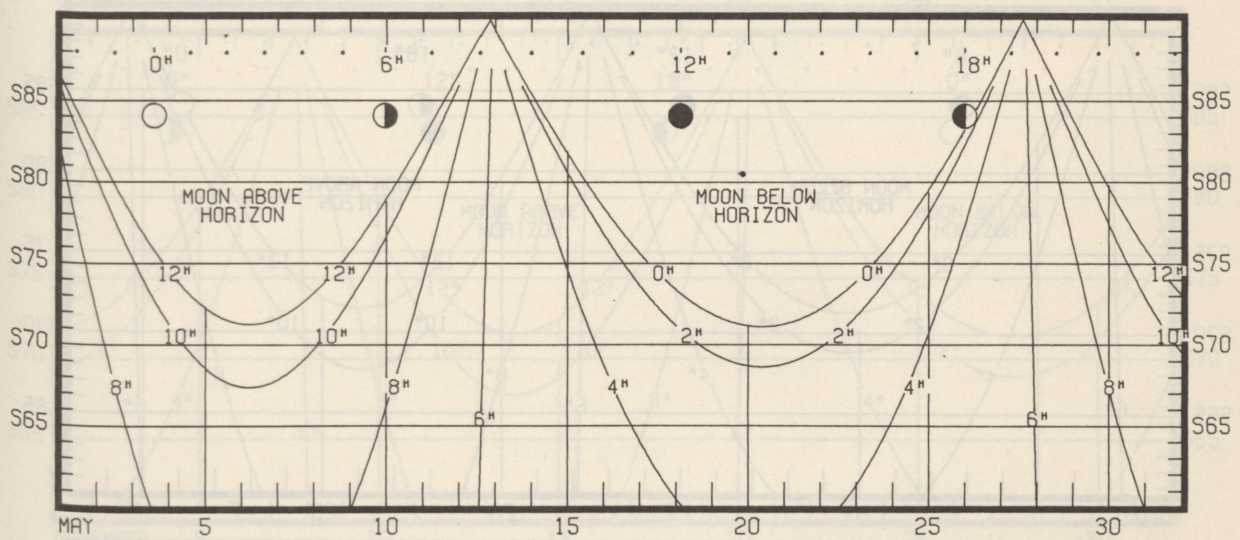
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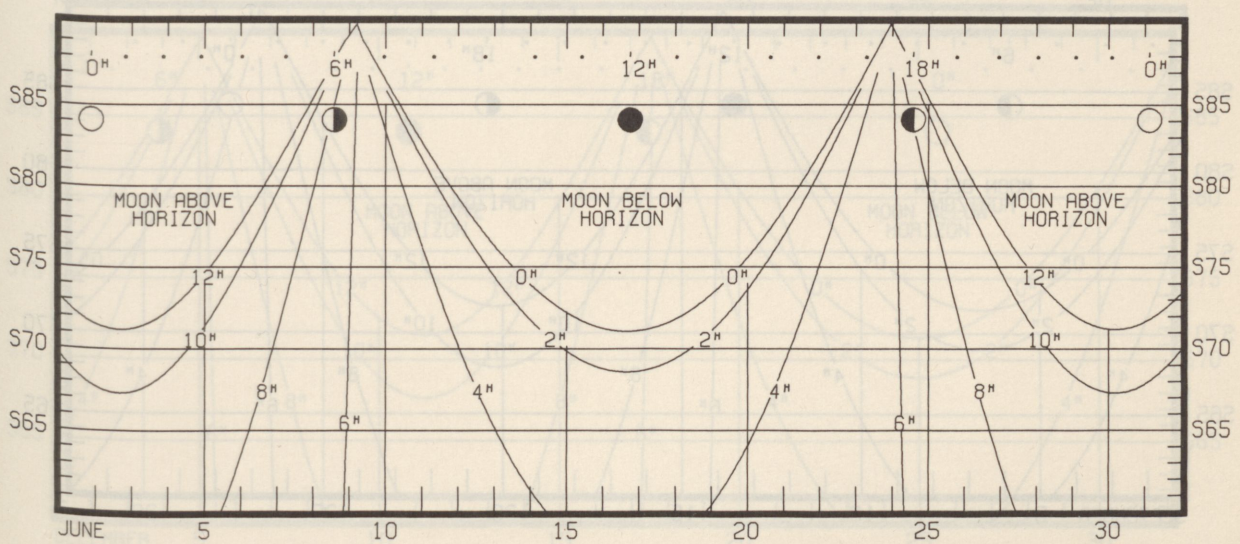
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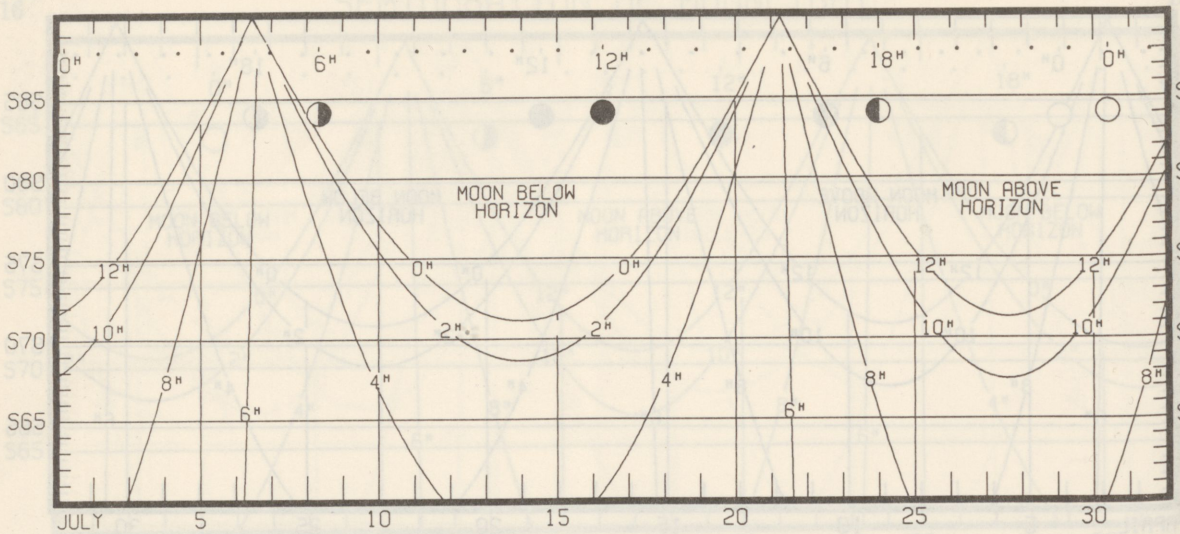
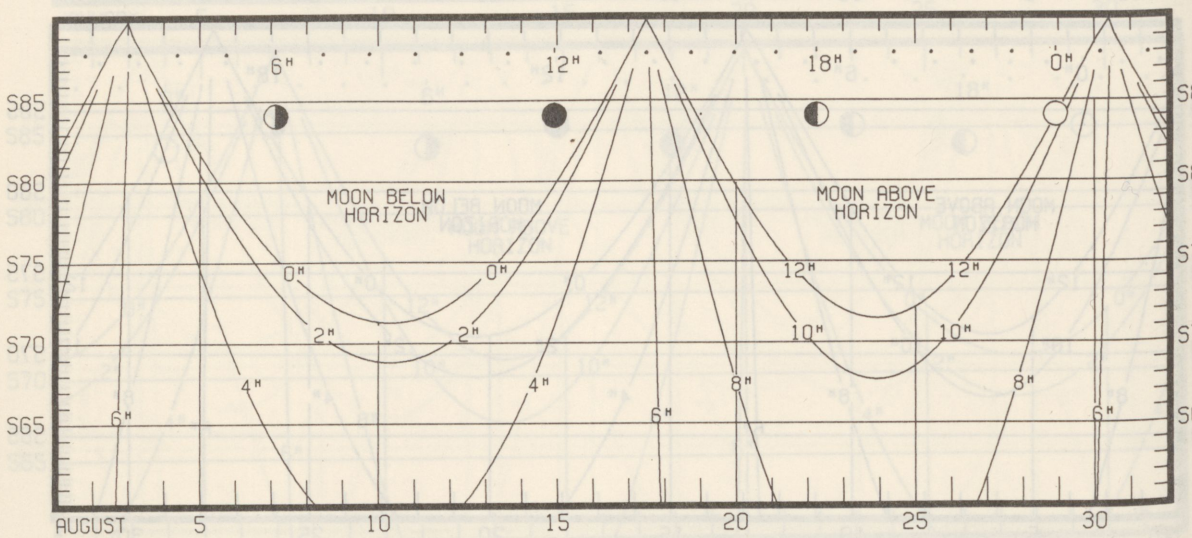
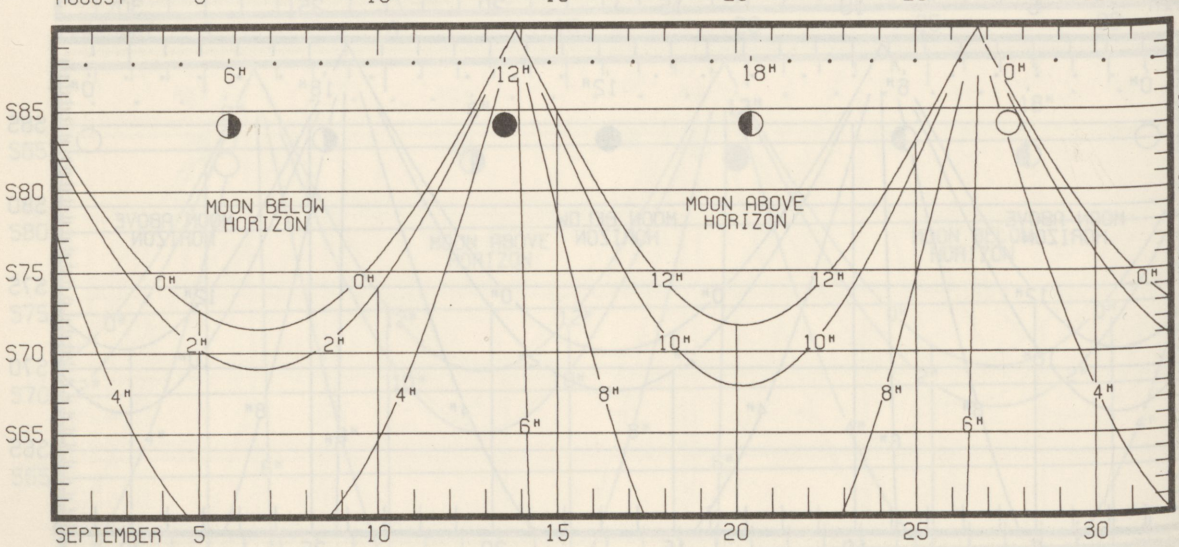
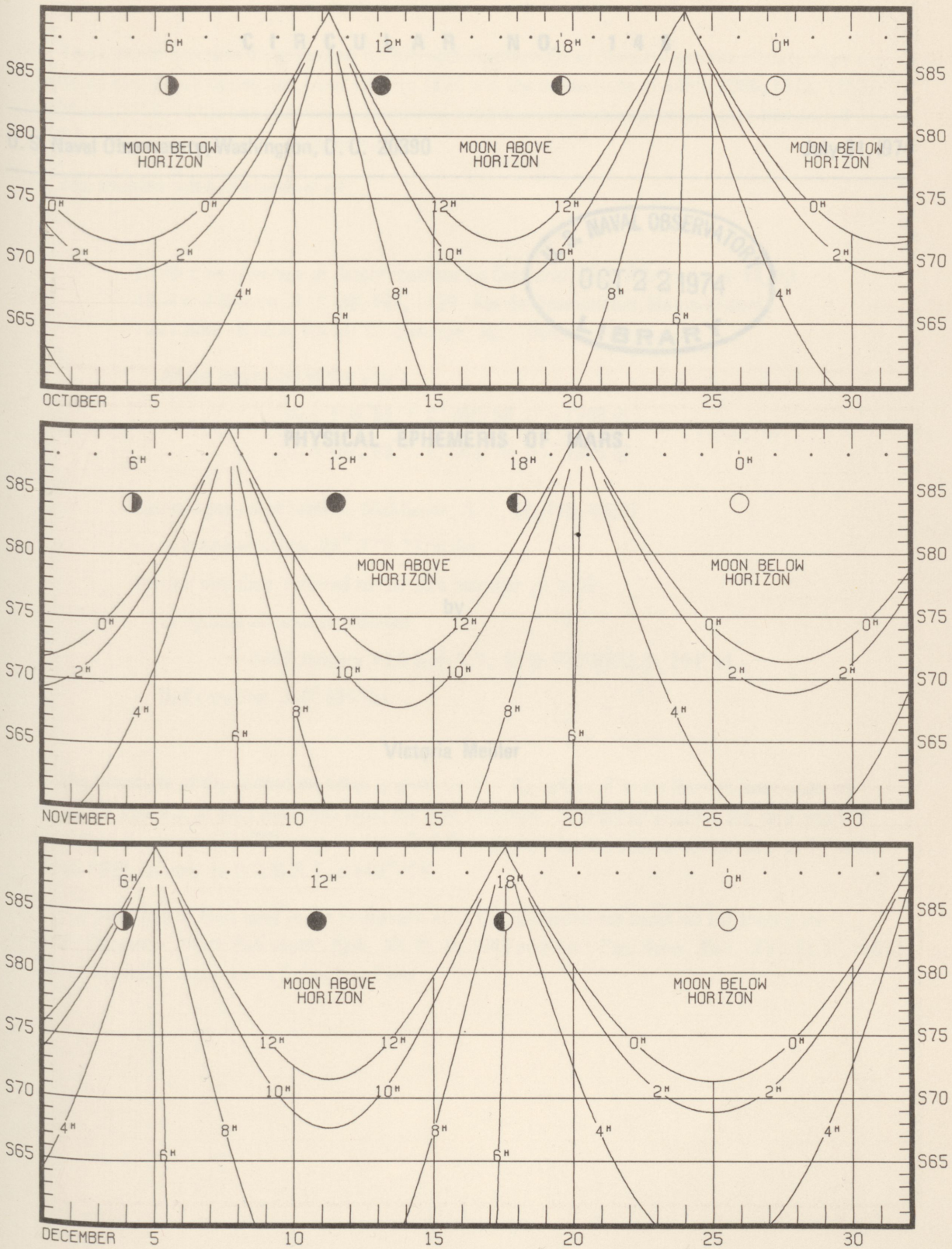
SEMIDURATION OF MOONLIGHT





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